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although this is difficult to prove. The cells and nuclei are found to be distinctly larger, as shown by measurements of nuclei of the pollen mother cells and of various other tissues. Drawings from transverse sections of the stems show clearly the larger size of the cells in the giant form. He concludes that "the character of giantness manifests itself in the cells themselves and not merely in the plant as a whole."

The reviewer has shown³⁸ that in *Oenothera gigas* the cells and nuclei are constantly larger than in *O. Lamarckiana*, but that the ratio of increase varies in different cases, the sizes being 1.5:1, 2:1, 3:1, or even more, though apparently constant for each tissue examined.—R. R. GATES.

Secondary growth in monocotyledons.—Evidence against the significance of histogenic layers in the stem apex continues to accumulate. SCHOUTE³⁹ dealt a severe blow to HANSTEIN'S theory when he showed that in *Hippuris* the plerome gives rise not only to the central cylinder but also to part of the cortex. As to vascular cryptogams, CAMPBELL⁴⁰ found that the vascular bundles of *Equisetum* originate from the cortical region. A monocotyledon has recently been studied by CARANO,⁴¹ who finds that in the young stem and leaf of *Yucca aloifolia* it is impossible to distinguish between plerome and periblem. The author concludes that in this stem the existence of two distinct regions, central cylinder and primary cortex, is absolutely unfounded. It may be objected, however, that in this case there is merely negative evidence, which will not settle the question for the monocotyledons. In the stem of this plant there is nothing corresponding to the pericycle of the dicotyledons, and the meristematic zone which gives rise to the secondary tissues is continuous with the apical meristem. Hence this zone is considered to be primary at the outset, though the cambial activity later spreads outward to mature cells, when the meristem and its products of course become secondary. The permanently active layer so established produces vascular bundles and parenchyma internally, and parenchyma externally.—M. A. CHRYSLER.

Affinities of an alpine flora.—Following the glacial relic theory postulated by GRAY and elaborated by HOOKER and others, HARVEY⁴² has studied the vascular flora of Mt. Ktaadn, Maine. Four distinct elements are distinguished: (1) the arctic-relic, (2) the pre-glacial alpine, (3) the endemic, and (4) the subalpine-lowland. Of these the last is regarded as not truly alpine, while the endemic flora consists of the single initial endemic *Carex Grahamii* and the relic endemic

³⁸ GATES, R. R., The stature and chromosomes of *Oenothera gigas* DeVries. Arch. f. Zellforsch. 3:525-552. 1909.

³⁹ SCHOUTE, J. C., Die stelär Theorie. Jena. 1903.

⁴⁰ CAMPBELL, D. H., Affinities of the genus *Equisetum*. Amer. Nat. 39:273-285. 1905.

⁴¹ CARANO, E., Su le formazioni secondarie nel caule delle Monocotiledoni. Annali di Botanica 8:1-42. pls. 1-4. 1910.

⁴² HARVEY, LE ROY H., The floristic composition of the vascular flora of Mount Ktaadn, Maine. Mich. Acad. Sci. Report 11:37-47. 1909.

Euphrasia Oakesii. The remaining arctic-alpine flora consists of 118 species, all but four of which are also found upon Mt. Washington. In the various tabular presentations of the affinities of this alpine flora, attention is directed to the ecological as well as the floristic similarity of mountains, coast, bog, and arctic habitats, and various arctic and alpine floristic areas are compared with Mt. Ktaadn. From the large number of common species (56 per cent), arctic Europe is considered to have been the center of distribution of the Ktaadn alpine flora, while its glacial migration seems to have been by the Greenland-Laborador route. Over 75 per cent of this flora is of arctic affinity.—GEO. D. FULLER.

Diffusion stream in plant organs.—RYWOSCH⁴³ continues his work on the movement of food materials in plant organs. The movements of course obey the laws of diffusion, a given substance moving in the direction of its lowest concentration. The thing of interest in his work is the discovery of various means by which the gradient is maintained. Two illustrations will show the nature of the results. If the cuticle is removed from any side of a starch-free pine needle and the needle placed in a 9 per cent sugar solution, the first deposit of starch is not on the side of the removed cuticle, where of course the sugar is most concentrated, but in the cells on the distal side. The entrance on one side through irritability leads to the more complete condensation of the sugar on the opposite side, thus maintaining a falling gradient and a continual diffusion stream of the sugar toward the distal side. In the cotyledons of the pea, also, he finds that the sugar is more completely condensed as the vascular bundle is approached, thus maintaining a falling gradient and continuous sugar diffusion toward the bundle.—WM. CROCKER.

Chromatin bodies.—Miss DIGBY describes⁴⁴ a peculiar phenomenon of a constant extension of chromatin bodies during the presynaptic and synaptic stage of the first nuclear division of the pollen mother cells of *Galtonia candicans*. According to her observations, the chromatin bodies may originate as portions of the nuclear network, or of the synaptic knots, or as nucleolar buds. They are composed of linin in which chromatin is imbedded, or of nucleolar material. Those bodies that come from the chromatic portion of the nucleus retain their connection with the nucleus, by means of a fine thread, until their disintegration. The bodies that pass from the nucleolus into the surrounding cytoplasm penetrate the cell wall and enter the neighboring cell. The chromatic bodies which originate as buds from the nucleolus at first take an acid stain, but as they pass into the cytoplasm they become increasingly chromatic. It is not known whether the bodies as formed become secondarily attached to the nucleus. Regarding the significance of this phenomenon, no interpretation is given by the author.—SHIGÉO YAMANOUCHI.

⁴³ RYWOSCH, S., Ueber Stoffwanderung und Diffusionströme in Pflanzenorganen. Zeit. Bot. 1:571-591. figs. 4. 1909.

⁴⁴ DIGBY, L., Observations on chromatin bodies and their relation to the nucleolus in *Galtonia candicans* Decsne. Annals of Botany 23:491-502. pls. 33, 34. 1909.